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SCIENCE NEWS-LETTER

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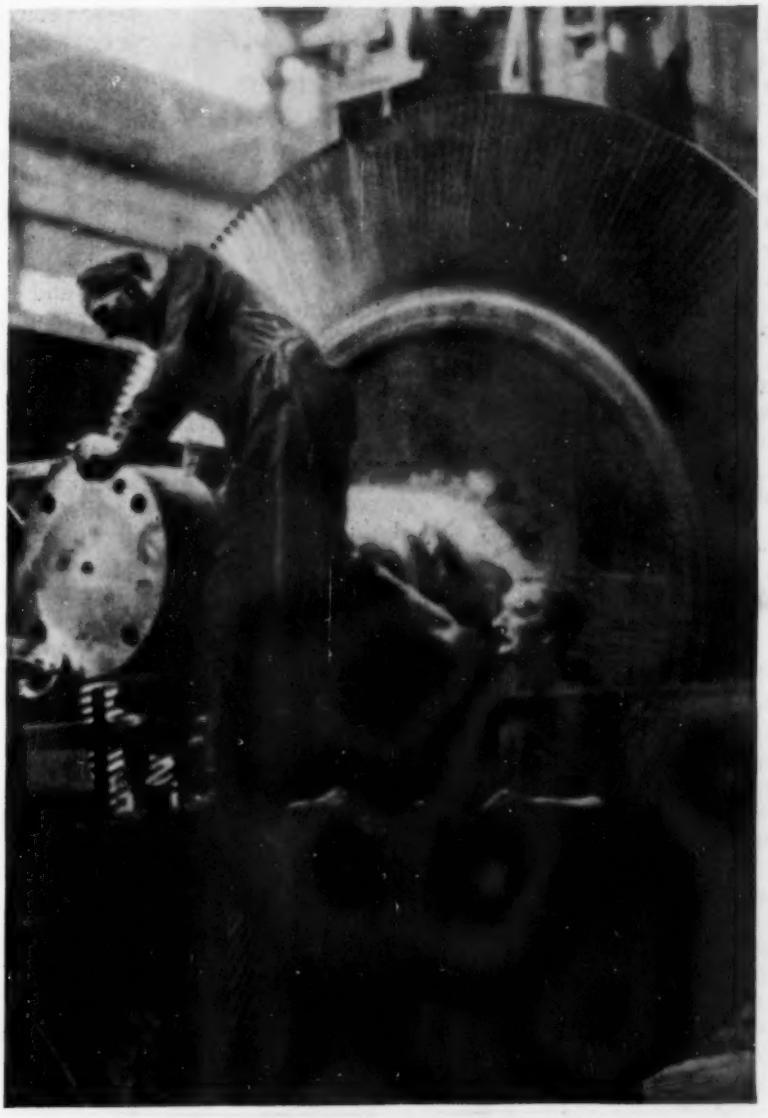

TURBINE IN THE MAKING

A Giant Wheel That Serves Industry

(See page 218)

Vol. XVI *No. 444*

Institute for Geography and History

The task of publishing a geography and history of all the Americas is to be one of the first undertakings of the new Pan-American Institute of Geography and History. This ambitious and important work is expected to be completed by 1935.

The institute, which recently held its first meeting in Mexico City, has elected as its active president Dr. Salvador Massip, professor of geography at the University of Cuba. Its honorary presidents are to be Dr. William Bowie, of the U. S. Coast and Geodetic Survey, and Dr. J. Toribio Medina, historian, of Chile.

The institute will study the prehistory of the Americas, the archæology, the history of the Colonial epoch, and events in recent centuries. The geographic studies will include topography, geodesy, cartography, geomorphology, human geography, ethnography, and historic, biologic and economic geography. A library of maps, books, and other data will be created in the institute's headquarters.

The new institution is to be of international usefulness in providing data on meteorological conditions for Pan-American air routes and in studying disputed boundary problems.

Dr. Bowie outlined the significance of the new organization:

"We have heard so much of the application of science to agriculture, industry, commerce, and communication, but science can only go so far in bettering conditions of humanity without geographical knowledge. The geographer must aid the chemist, the physicist, and the engineer, in efficiently utilizing the resources of nature.

"Civilization will greatly advance by an early mapping of the world. Maps are still very imperfect. Although much mapping has been done in the United States, only 43 per cent. of the area has been topographically surveyed, and many of these map sheets were inadequately made and do not serve the purposes of agriculture, mining, the development of hydro-electric projects, systems of communication, and transmission of power today.

"The Western Hemisphere is new to civilized man, and we must develop and utilize its natural resources as our present needs demand, but without impoverishing the generations to come. In this discreet development and utilization of natural resources, the geographer must play an important part, and the Pan-American Institute of Geography and History can exert a great influence in outlining general geographical problems to be solved, and in disseminating geographical data already existing but not widely known."

Science News-Letter, October 12, 1929

Peace Rangefinders

Peaceful passenger ships and fast cargo vessels now mount on their decks rangefinders such as heretofore have been seen only on ships of war. At the Shipping, Engineering and Machinery Exhibition in England there were exhibited these new additions to navigation equipment capable of accurately determining the range of objects 500 to 25,000 yards distant. Modelled after the same type of instrument that has been used for army and navy purposes for the past forty years, the rangefinder on shipboard allows the navigator to locate immediately any ship, lighthouse or other object. An instrument with a base of 4 feet 9 inches will measure distance to within 76 feet at 2 sea miles and 608 feet at 6 sea miles.

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Personality Defined

Our personality is not so much how we act but how others act toward us. When Prof. Mark A. May of Yale took issue with behavioristic definitions of character or personality that describe this valuable human trait in terms of the individual's own reactions he caused his auditors at the International Psychology Congress to recall Bobby Burns' wish "to see ourselves as others see us".

"Personality is the individual's social stimulus value", Prof. May said. "Responses by others to dress, physique, manners, voice, language, social actions, define his personality. If a person assumes an air of superiority and impresses others as refusing to associate with them, he is said to be snobbish. Snobbishness is not something he possesses but rather something that is inferred from the way he carries his cane, wears his necktie or speaks to others."

Newspapers, biographers, cartoonists, and press agents and sometimes public characters themselves often give great public figures personalities that they actually do not possess, Dr. June E. Downey of the University of Wyoming told the psychologists. What is called personality in these cases is, she said, aesthetic rather than scientific, a product of the creative imagination. Cartoons of Roosevelt for example inaccurately gave him a square head and square jaw, typifying the common impression of his virility whereas in his early political portraits he was actually drawn as a "dude" instead of a rough rider.

Science News-Letter, October 12, 1929

Wheels of Power

In the lull between creation and the fulfillment of its destiny, a great tubine undergoes the exacting scrutiny of its makers. Such is the subject of this week's cover photograph, taken in the shops of the General Electric Company where so many great power wheels are made.

Science News-Letter, October 12, 1929

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Ruffed Grouse Reared by Hand

By Marjorie MacDill

"Peep, Peep, Peep!" and a dozen tiny bits of brown fluff interrupted their meal of sour milk to scatter to the far side of the commodious pen in front of their brooder.

"These," said Dr. Arthur A. Allen, who has done the impossible in raising ruffed grouse in captivity, "are only a few days old. But here," pointing to another corner of the side hill dooryard on the edge of one of Ithaca's beautiful gorges, "is the group of twenty of which I am particularly proud. They are two months old now and we have lost only one. Quite a record for ruffed grouse."

"Of course," he added, "it is too early to make any rash prophecies but we have succeeded in overcoming a good many obstacles that have been met repeatedly both in my own experience and in that of others who have tackled this proposition. So we feel that at least a step has been made in the artificial propagation of a game bird that has become increasingly scarce in regions where it was formerly plentiful, and that at last we have a practical method of rearing them to suggest."

This energetic young man, whose skill in handling shy wild things has converted the grounds around his home into a miniature aviary, is professor of ornithology at Cornell University. For the past ten years he has been devoting a large part of his time to work on the ruffed grouse, whose drumming was once a familiar sound in the woods of all the northeastern states as far south as North Carolina and as far west as the Rockies. In a small enclosure at one side of sylvan dooryard tiny offspring of the wood duck, sometimes called the shyest and most beautiful of American game birds, take refuge under their bantam foster-mother's wing. In the shadow of trees and shrubbery hold forth gorgeous Reeve's pheasants, hardy woodland birds that Dr. Allen hopes may some day be developed to the point where they will live as successfully in this climate as the introduced ring-necked pheasant. Unlike the latter they prefer woodlands and not open fields and the farmer's corn crops. A pool in the gorge below has been fenced off for water fowl, while behind wire screening in still another corner flutter a flock of young meadow larks with

RUFFED GROUSE, America's ideal game bird

their lemon colored breasts, the scholastic property of a graduate student engaged in research on the habits of this well beloved whistler of the fields.

But the greatest amount of space is given over to the grouse chicks.

It is well known to sportsmen and naturalists that this bird goes through more or less regular cycles of abundance and scarcity. Recent years, however, have seen a downward trend in the grouse population that in some states approaches downright extermination. New England still has a fair number. In parts of Pennsylvania, probably owing to a combination of intelligent game laws and the possession of many miles of wooded territory such as the grouse best likes, a good many have survived; but these records are unique. The years 1927 and 1928 saw the lowest ebb in the number of grouse throughout their ranges in both this country and Canada, that has ever before been recorded. Many believe that an epidemic is responsible for this great decrease of the finest of American game birds, but it seems more probable in the light of much of Dr. Allen's work that it is due to a variety of reasons.

Running down the cause, or rather causes, of this so-called grouse disease, and at the same time trying to develop a practical method of rearing baby grouse in captivity, have been the two interrelated avenues of research by which the Cornell ornithologist hopes to restore the bird to a degree of its former abundance in the woodlands throughout the northeast. Gradual replenishing of coverts and wise game laws should do the rest in recovering for American sportsmen one of the favorite prizes of autumn game bags.

Dr. Allen first began to try to raise grouse chicks in 1919 when an experimental game farm was established at Cornell University. His experiments were just getting a fair start when the farm perished from lack of financial support from the state legislature. So there was nothing to do but carry on in the limited space around his own home.

Here, within the confines of his own dooryard, he found he had an excellent chance to become familiar with various diseases to which the bird is subject. Anyone who has tried to grow young turkeys knows something of the proposition he was up against. One can start early in June with a likely brood of young turkey chicks and feel lucky if he has four survivors by the first of August. This familiarity naturally made him more observant of birds in the field and led him on to the track of valuable information.

The disease most fatal to grouse chicks turned out to be identical with one that attacks young chickens, turkeys, pigeons and canaries. It took its heaviest toll before the victims were three weeks old and is caused by a minute animal parasite of the intestinal tract. The scientific name for this grouse variety of infant's colic is coccidiosis. Blackhead, another disease all too well known to turkey growers, was also a source of trouble in the young grouse. Like coccidiosis, it is caused by a minute protozoan, possibly the same one.

Eventually he discovered that both these parasites were traceable to the bantam hen foster-mothers that were helping him bring up his experimental chicks. Most domestic fowls, though subject to these diseases, usually acquire immunity, but still act as carriers. For this reason the bantam foster-mothers had to be abandoned and the grouse babies entrusted to the more impersonal but sanitary protection of heated brooders. In the wild state there is very little chance of infected birds spread- (*Turn to next page*)

Ruffed Grouse Reared by Hand—*Continued*

ing these diseases until they become very abundant and range over the same ground day after day. In the seasons when very few young are reared in the coverts it may well be that one or the other of these diseases are to blame, the ornithologist pointed out.

A much more insidious disease, however, took off many of the survivors Dr. Allen had succeeded in bringing almost to maturity. It was found to be caused by a stomach worm. From careful autopsies on birds found dead in the field, it appeared that it was responsible for a large number of deaths of grouse in the wild state as well.

About this time (1924) the grouse research at Cornell began to attract considerable attention. The American Game Protective Association decided to get behind the movement and money was subscribed to carry on the work on a more extensive scale. It was decided to extend particularly the investigation of the life history of the parasites discovered preying on the birds. The cooperation of sportsmen throughout the grouse country of America was enlisted to aid the cause by sending in specimens of birds found dead in the field. Directions for preserving them for mailing and questionnaires about the number of grouse present in the coverts and what food they ate at different seasons of the year and similar points were broadcast through the game journals. In short, every attempt was made to uncover as much of grouse activities as possible from the time an egg was hatched until the young were in the nest again. For it was felt that it was impossible to foretell what little fact would turn out to be of the utmost importance in shedding some light on the life history of the attacking parasites and consequently on the control of diseases.

As a result of this drive undertaken in 1924 and 1925 nearly 900 specimens were received in the season 1925-1926. From studies made on these birds it was evident that no one disease is responsible for the disappearance of grouse. Over twenty different parasites and diseases were found as the result of this part of the investigation. Some of these, Dr. Allen declared, are abundant and of general distribution while others may turn out to be of only local importance.

DR. ARTHUR A. ALLEN of Cornell University, with a flock of his home-reared grouse

Meantime, each spring saw several flocks of fluffy brown grouse babies hatched out at the Allen home. Brooder substitutes for the bantam mother marked a great step forward. The eggs were hatched in an incubator and the new chicks left to the tender mercies of a heated brooder opening into a wire enclosed pen where they are free to run around in the sunshine when the weather is fair.

"There are two very important points in rearing grouse in captivity," said Dr. Allen. "These are sanitation and nutrition.

"Pen, brooder and chicks must all be moved repeatedly to different parts of the grounds every few days to avoid reinfection from parasites. By avoiding the foster-mother carrier and changing ground frequently we have been able to keep the young birds free from parasitic infections during the critical first few weeks during which such severe losses were suffered when the work was first begun.

"Food, naturally, must be given very careful attention," he continued. "The grouse farmer will need food that approximates that of the bird in the natural state yet it must be such that it can be raised in quantity at not too great a cost. We give young chicks sour milk at the beginning but our first trouble is to get them to eat it. New-hatched grouse instinctively try to catch their food on the fly. They don't look for it on the ground but want to pick it out of the air or off the bushes. So we smear sour milk on shingles and set them up against the side of the brooder. Then they learn to know it by sight in a few days and eat it out of a dish. Later on we give them ground hard-boiled eggs, pheasant meat and a little cracked wheat and sunflower seeds. We do not give them corn. In general they require very little grain. Wild grouse live on fruits a great deal, such as strawberries and wild blackberries. So we have tried them out on things like mulberries and raspberries and find they do very well.

"Since grouse need a certain amount of insect food we have been meeting this requirement by rearing bluebottle and greenbottle flesh fly larvae for them. This is a rather troublesome and disagreeable feature, however, that we hope to simplify somewhat when we have the method worked out in shape to present as a practical means of grouse rearing on a large scale."

The season for 1926-1927 was marked in grouse history by an invasion of goshawks swooping down out of the north. Goshawks are among the fiercest of American birds of prey that have been known in bad years to snatch a hunter's kill away before he can pick it up. They have a special fondness for grouse. During this particular season they slaughtered them in enormous numbers in some regions. This was probably one reason why the grouse population reached an extremely low level in 1928 throughout many parts of its range. All of the provinces of Canada except Quebec and the Yukon declared a closed season, as well as nine of the northern states in this country.

Because of this shortage no effort was made to collect specimens for investigation since it was felt that the few surviving birds left in the coverts were probably healthy anyway and needed protection to help bring the numbers up the following year.

In spite of the recent shortage, the total number of birds examined in the laboratory since the work started, taking together the ones studied at Cornell and those handled in a separate investigation in (*Turn to next page*)

New "Triangle" Parachute

A revolutionary type of parachute that may ultimately take the place of the standard one now in use has been developed by the Army Air Corps at the experimental laboratories at Wright Field, Dayton, Ohio, after more than a year's research.

Though the materials, general size and principle of operation of the present-day "flyer's umbrella" are utilized, the newcomer has a different kind of mainsail, far more stability and safety of operation, and a unique type of pilot "chute".

Instead of the circular mainsail a triangular one has been substituted, with two corners rounded and the third sheared straight across. The shroud lines extend down, spaced regularly as in the standard 'chute, except across the sheared-off corner, which has no shroud lines at all. The result is that when the parachute is open, this corner forms a tail-like vent through which the air escapes.

More than a dozen jumps and a hundred dummy drops have been made with the new 'chute. These indicate a decreased oscillation and shock to the jumper at the time of opening, besides greater steerability in descent. This improved operation is accomplished mainly by the new mainsail. The air escaping through the tail-like vent propels the 'chute horizontally at a speed of from three to four miles an hour. Because the parachute inherently possesses this horizontal motion, steering can be accomplished by the manipulation of the shroud lines and the 'chute can be turned so that the vent is with or against the wind, controlling the desired direction.

The decreased shock to the jumper results from a second round vent at the apex of the mainsail. Prior to operation the vent is closed, but when the 'chute starts downward, the vent automatically opens. It causes a very slight swerve from course and virtually no swing.

A feature adding to the safety of operation upon opening is the new springless, non-foulable pilot parachute. It is 30 inches long and 36 inches in diameter. The lobes have partitions which extend to a long central elongation fastening directly to the apex of the mainsail, making shroud lines unnecessary.

Moreover, whereas in the standard 'chute the actuation of the pilot umbrella is supplied by springs, in the triangle 'chute it is achieved by a different method of packing.

The new pack has rounded corners for better wear and to prevent folds of the silk slipping through. As in the standard parachute, the shroud lines are packed in pockets, zig-zagged across the bottom of the pack. The mainsail is folded on top.

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Ruffed Grouse Reared by Hand—*Continued*

New England under the direction of Prof. A. O. Cross of Bowdoin College and a western investigation in charge of Prof. D. J. Leffingwell of the Washington State College of Agriculture, has reached the neighborhood of 2600 specimens. The examination and study of birds in such numbers has, of course, given ornithologists a much better picture of the life history and physiology of the ruffed grouse than was ever possible before.

One of the most interesting features of this investigation was the recent attempt to link grouse up with tularemia, the rabbit plague that has swept over the country in the last few years and which has attracted wide attention from the number of human victims that have succumbed to it. It was shown by Dr. R. R. Parker of the Spotted Fever Laboratory and Dr. Green of the University of Minnesota that grouse could be artificially infected with the disease and it was thought that it might be transmitted to the birds by natural means through the rabbit tick with which they also are infested. As yet, however, Dr. Allen points out, not a single known case of tularemia in a ruffed grouse contracted by natural means even in captivity has been found. The problem is complicated by the fact that tularemia is difficult to identify in birds. The only sure means of establishing the case is to reinfect guinea pigs with serum from the dead birds, which in the case of true tularemia will produce typical lesions in these animals. The experiments with tularemia and grouse are being continued but at the present time no definite knowledge has been brought to light that this disease is in any way responsible for the grouse shortage of the last year.

THIS BRIGHT YOUNG FELLOW is just seventeen days old

Dr. Allen's activities in this work are not limited to grouse farming in his dooryard and grouse autopsies in his laboratory. He is also deeply concerned with the conditions of grouse life in the wild. About seventeen miles southeast of Ithaca is a tract of hill land of about 13,000 acres, known as Connecticut Hill. Within this area the New York state conservation commission has decided to develop a game refuge and demonstration forest. Options have already been taken on about 4000 acres. In this area Dr. Allen and one of his associates, Gardiner Bump, picked out a tract of land of about 1200 acres and by the expenditure of infinite pains and time took a census of all the grouse it contained. Records were made of all the plants and shrubs with special reference to the ones that partridges, as the farmers call them, like to eat. A careful check will be kept on the number that survive each year and every attempt made to find out, in so far as possible, all about the private life of the grouse tenants of this typical piece of covert.

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Ultraviolet Windows Tested by U. S.

How to let the ultraviolet rays of the sunlight through the window into home and schoolroom was discussed by Dr. W. W. Coblentz, physicist of the U. S. Bureau of Standards at Washington, in a report to the Illuminating Engineering Society. He reported his tests upon various window glasses and other materials and suggested that for effective results the material should not transmit less than 45 to 50 per cent. of the ultraviolet rays in the sunlight.

If only small amounts of the ultraviolet rays penetrate the windows they can not be relied upon to effect cures of rickets, which are possible with large doses of ultraviolet rays as well as with sources of vitamin D. Dr. Coblentz quoted clinical reports that indicated that exposures of five to seven hours each day with light through glass with 25 per cent. transmission would be necessary merely to prevent rickets in a normal, properly fed child, and in view of the fact that such exposures of such lengths are not practicable, he believes that at least 45 to 50 per cent. transmission must be required in specifications. Even with this degree of transmission, the effect would be preventive only and in no sense curative.

Various commercial makes of glasses, after being stabilized by exposure to sunlight, ranged from only one-half of one per cent. to 59 per cent. transmission, with four out of nine greater than 40 per cent. Dr. Coblentz used a wave length of 302 millimicrons as a division point between the ultraviolet rays and the rest of the sunlight.

Tracing cloth, which has been suggested for window material because of a supposed transparency to ultraviolet rays, was found to be actually no more transparent than other fabrics such as nainsook, batiste or balloon cloth. Other studies of fabrics showed that those made of silk and wool yarns compared favorably in transmission of ultraviolet light with cotton, linen and rayon.

Feathers have a fairly high transmission, apparently nature's provision for assuring chickens and other birds their supply of these vital rays. Unlacquered surfaces of metals, aluminum, nickel and chromium, are good reflectors of ultraviolet radiation. Linseed oil and nitro-cellulose lacquer, especially after drying, are highly opaque to ultraviolet radiation.

Science News-Letter, October 12, 1929

Smoke and Ultraviolet Light

Loss of health-giving ultraviolet light in cities is an important problem which present methods of smoke control do not solve, members of the American Public Health Association were told by Dr. Fred C. Tonney of the Chicago Health Department, who reported on studies made by himself and his associates, Gerald L. Hoeft and Paul P. Somers.

Using a new method of measurement, these scientists measured the amount of ultraviolet light in the atmosphere of Chicago at street level at various points in the city and compared it with similar measurements made in the nearby country. Some measurements were also made from the top of one of the city's buildings. The readings were made simultaneously at the "clear points" and at the points within the city. The study was carried out over a period of more than two years, readings being made twice or more monthly.

Much of the ultraviolet light intensity available at the clear points was lost at all the urban points tested at all seasons of the year, the investigators found. From a health standpoint the most serious obscuring effects were observed in the late fall and early spring months.

"The doubtful potentialities of ultimate effectiveness of smoke control methods in conserving ultraviolet light are to be seen in the warmer season when combustion of fuel for heating purposes is at its minimum," declared Dr. Tonney. "The material loss of ultraviolet light occurring during this season of minimum smoke production suggests the likelihood of probable failure of smoke abatement as applied to present combustion processes, insofar as conservation of ultraviolet light is concerned.

"The emission of particles of burned or unburned fuel is apparently an inherent property of the combustion devices at present generally available. Considering the importance of sunshine to health, are we not justified in advocating the ultimate electrification of heating processes as the final solution of the smoke problem of cities?" asked Dr. Tonney.

Science News-Letter, October 12, 1929

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of SCIENCE NEWS-LETTER published weekly at Baltimore, Md., for October 1, 1929.

District of Columbia—ss.

Before me, a notary public in and for the State and county aforesaid, personally appeared Watson Davis, who, having been duly sworn according to law, deposes and says that he is the editor of the SCIENCE NEWS-LETTER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Editor, Watson Davis, B and 21st Sts., Washington, D. C.

2. That the owner is: Science Service, Inc., B and 21st Sts., Washington, D. C., a nonprofit making corporation without stock organized for scientific and educational purposes.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

WATSON DAVIS,
Editor.

Sworn to and subscribed before me this 1st day of October, 1929.

CHARLES L. WADE,
Notary Public.

(My commission expires April 6, 1933.)

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Borneo Calling South Pole

The jungles of Borneo will soon be talking with the icy wastes of the Antarctic continent where Commander Byrd's men are wintering. Borneo has already talked with Washington and Chicago, by means of a short-wave radio set in the hands of the scientists of the All-American Lyric Expedition, now far into the jungles of the world's largest and least-known island.

John H. Provinse, anthropologist of the expedition, has just communicated with his chief in Washington, Prof. Fay-Cooper Cole of the University of Chicago, chairman of the division of anthropology and psychology of the National Research Council. He transmitted his message through Station W8GZ, Columbus, Ohio, a member of the American Radio Relay League. The same station has undertaken to send the return message.

The speed with which the message came from the opposite side of the world contrasts strongly with conditions prevailing only six years ago, when Prof. Cole went into the same territory on a preliminary scouting expedition. At that time messages could be sent only by mail, from the Dutch station at Poeroek Tjahoe, a town on the Barito River, and the explorer had to bring them there in person. From there they were carried to the coast by a flat-bottomed steamboat, which plied once in two weeks at the oftenest. Under the most favorable conditions a letter could thus reach the United States in about ten weeks; usually it took much longer. But the short-wave radio now brings central Borneo as close as the nearest telegraph office.

Mr. Provinse is in Borneo for the purpose of making a scientific study of the Siang Dyaks, a native Malay people never before subjected to thorough anthropological examination. He states that he has established himself in a Siang kampong or village two days up the river from Poeroek Tjahoe, where he finds the people friendly and conditions favorable for his work.

Among Mr. Provinse's notes are entries indicating that he is very decidedly "east of Suez". He attended a "tiwah" feast attended by over 400 men from 32 villages, where everybody got somewhat more than he could hold of a native brew called "tuak". Out of courtesy he had to drink half a carabao horn full of it, but it was a good deal more than he wanted, especially since the genial Siangs had not been at all particular about straining out ants, small flies and other unnecessary foreign substances.

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Marriage and Death

Your chances of marrying and dying within five years are seven in one thousand if you are a young bachelor of 25 years, statisticians of the Metropolitan Life Insurance Company have computed. But your chances of marrying and dying in twenty years are seven in a hundred. Similarly a single young woman of 25 years has seven chances in a thousand of marrying and dying within five years, but she has over six in a hundred of marrying and dying within 20 years.

A girl of 15 has the same chance of marrying and dying within five and one-half years as a woman of 35. This is because the younger girl has a much greater chance of marrying within the specified period, but she also has a considerably smaller chance of dying within that period than the older woman.

The probability of marrying and dying within a specified period is relatively small throughout life, but much smaller than the probability of marrying and surviving to the end of a specified period, the statisticians pointed out. This is due to the fact that either the chances of dying are relatively small, as in the case of younger persons, or the chances of marriage are small as in the case of older persons.

Science News-Letter, October 12, 1929

Seventy Years Still Life's Limit

When Moses stated that 70 years was the length of a man's life, save for exceptional cases, he set a limit that all our modern science has not been able to overstep.

In spite of the remarkable progress in public health practices and in medicine during the last century we cannot hope that the span of human life will be lengthened, Dr. Louis I. Dublin told members of the American Public Health Association.

A study of the mortality figures since 1920 among the general population of the country and among the insured of the Metropolitan Life Insurance Co. show a decreased ability for people to live much longer than 65 years, Dr. Dublin said.

"The expectation of life has increased, but the span of life has remained stationary. A fundamental distinction must be made between the two. The former, which is the average length of life of people in a stationary population, has shown appreciable gains and will continue to increase as public health improves and more and more diseases are brought under control. The latter has remained stationary for a long time, and it is altogether unlikely that man will be able to do anything to change it. The span of life seems to be fixed by the nature of man himself. His internal structure wears out after so many years of work and use and he appears unable to master its weakness or give it stamina to last longer.

"That twenty years have been added to the average length of human life since public health work began to be actively practiced in the early eighties of the last century is true. But this gain can be traced to the reduced mortality of infants and to the cutting down of the unnecessary and preventable deaths of young people from typhoid fever, diphtheria, scarlet fever, smallpox and a host of other diseases which for the most part affect persons under forty years of age. Improvement, after age forty, has been slight and almost altogether limited to women. This lack of improvement is all the more striking in view of the great effort that has been made to interest those in middle life in the conditions of their health. Such campaigns as center around the physical examinations are very desirable, but their value, so far as they go to extending the life span, is questionable. Their greatest worth is in making old age freer of discomfort," Dr. Dublin declared.

In other words, more babies will survive the perils of infancy and childhood and grow to be men and women, but the grown men and women today will die at the same age as they did a century ago.

Science News-Letter, October 12, 1929

Anatomy a Vital Science

Dr. Samuel R. Detwiler, professor of anatomy, in an address at the opening exercises of the Medical School of Columbia University:

An anatomical laboratory is no doubt frequently thought of as a place characterized by the presence of a morgue, and large vats filled with formalin-soaked specimens; a place where rattling bones reside upon shelves to be delved out to beginning students in order to revive their powers of memory which they may have lost during the more or less carefree activities of their academic careers.

Based upon the experience of others, it may be regarded as a place where thousands of tedious facts must be learned and later forgotten before the gratifying emoluments attending the practice of medicine may be fully realized.

An anatomical laboratory does possess what I have mentioned—a lot of dead things—but if this were all that characterized the place, anatomy as a science would be as dead as the cadaver which is placed at your disposal in order that you may hack out the necessary morphological slices preparatory to the practice of surgery.

Anatomy is very old. Throughout the ages it formed the keystone around which systems of medicine were elaborated. As far back as the reign of the Yellow Emperor, Huang Ti, over 2000 years B. C., anatomical charts were assembled, which formed the basis for the curious art of needling or acupuncture which has been practiced throughout centuries and even to the present day in China.

Anatomy was studied by the Egyptians, the Alexandrians, the Persians and the Greeks—ages before its dawn in medieval and modern Europe.

With the long background which anatomy has had, it has not advanced nearly as rapidly as many of the other biological sciences. This may be due in part to the restricted sense in which anatomy has been viewed, but more probably to the failure of the anatomists in not employing, earlier, experimental methods. It is clear to everyone, I believe, that the sciences which have employed experimental methods have advanced by leaps and bounds over those in which phenomena have been studied merely as nature presents them.

Anatomy is now in the hands of various instruments of experimentation, and can truly be said to have passed from a science of statics to one of dynamics. Consequently, most modern anatomical laboratories are no longer characterized solely by the presence of cadavers, formalized specimens and bone boxes, but with such pieces of physical and physiological apparatus as are necessary to an experimental study of the dynamics of living organisms as they bear upon the problems of organic form and function.

Medicine is no doubt headed towards the stage of exact science, and its ultimate success lies not in the treatment of symptoms, but rather upon the co-operative investigation of causation. Every patient is a research subject and every malady a research problem.

The intelligent study of cause and effect in diseased organisms must be preceded by a working knowledge of cause and effect in the production of normal or essentially normal organisms. Medicine is demanding more and more the co-operative efforts of all scientists who venture to inquire into the matter of causation in the biological world.

As a result, departmental barriers are rapidly crumbling save perhaps for the purposes of administration.

Science News-Letter, October 12, 1929

Fizz Gives Rats Appetite

Carbonated beverages may yet be on the approved list of nutritionists, recent studies indicate.

The fizzy drinks when fed to rats had no harmful effects. On the contrary, the rats grew well and reproduced, raising large litters. Instead of having their appetites spoiled by the carbonated drinks, they took more milk and more water. In fact, their increased growth and reproduction were attributed to the increased milk consumption that was stimulated by the fizzy drink, which was a grape carbonated beverage.

The study, reported to the American Public Health Association, was carried out by W. B. Cook, Lillian B. Storms, Max Levine and J. H. Buchanan of Iowa State College.

"There is no evidence in any of the work that any detrimental results occurred as a result of adding carbonated beverages to the diet of the animals," reported the scientists. This is cheering to those who like the effervescent beverages, for rats are the laboratory animals used to test new theories in nutrition before they are applied to human beings.

Science News-Letter, October 12, 1929

Tomato seed, once regarded as a waste of the catsup industry, now are used as food and as a soap ingredient.

Keep Sweets in Own Place

Sweets must be kept in their proper place in the diet of children and that place is as a preservative and flavoring, Prof Henry C. Sherman of Columbia University, chairman of the Committee on Nutritional Problems, reported to the American Public Health Association.

"It is a sobering thought that sugar, as it now comes into commerce, is the most completely devoid of proteins, vitamins, and mineral elements of all the foods which we give our children. From the nutritional standpoint therefore it would seem that sugar should be of all foods the most cautiously used in feeding children lest it displace too much of the foods which can do what it cannot in supplying the proteins, vitamins, and mineral elements which the children need so urgently and so abundantly for their healthy growth and development," reported the committee.

The argument that candied fruits, milk chocolate and ice cream are foods that convey minerals and vitamins is true only to the extent that these foods contain milk, fruit or other foods which are good sources of minerals and vitamins. The sugar itself contributes nothing except the calories. While active children need calories, they also need minerals, proteins and vitamins to help them grow, and they should be fed largely on the foods which furnish these important substances along with the calories.

"In general the proper place of sugar in the food supplies and eating habits of children is not in such concentrated forms as candy, nor in the indiscriminate and excessive sweetening of all kinds of foods, but rather as a preservative and flavoring to facilitate the introduction into the child's dietary of larger amounts of the fruit and the milk, the importance of which to child health has been increasingly emphasized with each year's progress in our knowledge of nutrition," the report concluded.

Science News-Letter, October 12, 1929

Nature Study School at Yellowstone

Nature at its wildest and grandest will be studied at first hand next summer in Yellowstone National Park by a picked group of students under nationally known teachers. The opening of the new school of natural history has just been announced by Park Naturalist Dorr G. Yeager.

It is to be a training school for nature guides and teachers in natural history. The work will be of strictly university standard, although no university credit will be given. The number of students will be limited to 35, and selection of students will be made on the basis of the date of application, the latter to be in writing. Two years of college training or the equivalent will be considered as the maximum requirement, and any man or woman between the ages of 20 and 50 years, with the necessary educational qualifications, is eligible for enrollment in the school. Applications for enrollment should be made to Park Naturalist Yeager at Yellowstone Park, Wyoming, not later than March 1, 1930.

The field headquarters of the school will be at Roosevelt Lodge, which is located on the site chosen by former President Roosevelt and John Burroughs as one of the most beautiful in the park and containing the greatest variety of wild life.

Four weeks will be spent in and about field headquarters in the study of botany, zoology, geology, and geography of the region. In addition, four days will be spent at each of the four main centers of travel at Mammoth Hot Springs, Old Faithful, Yellowstone Lake and the Grand Canyon of the Yellowstone. At Mammoth and Old Faithful especial attention will be given to the study of the algae and bacteria in the hot springs and to the geology of the hot springs and geysers. In this connection the recently-completed hydrothermal museum at Old Faithful will prove of unusual interest.

This is not the first venture of the National Park Service in establishing field schools. The Field School of Natural History in Yosemite National Park, California, has just completed most successfully its fifth successive year. This school is conducted in cooperation with the State Fish and Game Commission of California.

Science News-Letter, October 12, 1929

Anti-Vitamin May Cause Rickets

Oatmeal and other cereals are suspected of harboring an "anti-vitamin" which, when too much cereal is eaten, can counteract the effects of vitamin D and cause rickets even when an otherwise adequate diet is being eaten.

Most scientists have concluded that vitamin D, which is found in fats, notably cod liver oil, can prevent rickets, the disease that causes faulty bone formation with the familiar bowed legs and bulging foreheads in infants and children. This disease has been considered due to poor nutrition and principally to a lack of vitamin D in the diet.

However, recent experiments with cereals show that rickets is not purely a result of too little vitamin D but is primarily due to a lowering of the amount of calcium in the blood, Dr. L. Mirvish of the University of Cape Town Medical School has reported to the scientific magazine *Nature*.

The presence of rickets-producing "anti-vitamins" in cereals, chiefly oatmeal and wheat, was first indicated by experiments of Prof. Edward Mellanby of Sheffield University, England, who called the substances "toxamins".

Following this lead, Dr. Mirvish extracted the "anti-vitamin" substance from oatmeal and injected it into rabbits. He found that the calcium in the blood was lowered as a result of these injections. This bore out and explained the work of other investigators who found that rickets can be induced in young animals by feeding them an excess of cereals or by adding extracts of cereals to a diet which did not produce rickets in control animals.

Rickets may prove to be a sign of underactivity of two small glands in the neck, known as the parathyroids, and thought by some authorities to have an important relation to the supply of calcium in the blood, Dr. Mirvish suggests.

"If that is the case, our present conception of the role of vitamin D and probably of the other vitamins will have to change very appreciably," commented Dr. Mirvish.

Science News-Letter, October 12, 1929

Nature Ramblings

By Frank Thone

Fringed Gentian

"Thou blossom bright with autumn dew,
And colored with the heaven's own hue . . .
Thou waitest late and com'st alone,
When woods are bare, and birds are flown
Then doth thy sweet and quiet eye
Look through its fringes to the sky,
Blue—blue—as if that sky let fall
A flower from its cerulean wall."

Thus William Cullen Bryant, many years ago. Like all of the earlier American poets, Bryant was a lover of nature and liked to write about woods and wild things.

But he did too good a service to the fringed gentian. Attractive enough by itself, the weight of literary favor proved overwhelming to the poor flower which was was carried off in thoughtless handfuls by people who really liked flowers, but did not stop to think that possession usually means destruction. The choicest things must usually be left untouched; they perish when we reach out and take them.

Such at least has been the fate of the fringed gentian. Once common in the eastern part of America, it is now one of the scarcest of our native flowers. It is no exaggeration to say that there are thousands of people who regularly walk the woods and fields in the fall, in places where the fringed gentian might be expected to grow, who have never in their lives seen one. Yet they in their turn often as thoughtlessly rob their grandchildren of flowers still left in existence, as their forefathers in their day robbed them.

It is seldom possible to grow the fringed gentian in a garden. No one, finding a gentian growing wild, should carry it home for transplanting, unless it is plainly in the path of a steam-shovel or other form of destruction. Wild things are best left where they are, so long as there is even the slenderest of chances for them.

Science News-Letter, October 12, 1929

International Study of Pacific

Scientific cooperation between all the nations whose lands border on the Pacific Ocean, toward the conquest of research and practical problems involving all of the sciences, was urged before the meeting of the Pacific Science Council in Java, from which Dr. T. Wayland Vaughan, director of the Scripps Institution of Oceanography has recently returned. A number of resolutions, putting various steps of the contemplated program into definite form, were laid before the Council and unanimously adopted.

One of the most ambitious of the projects is the surrounding of the Pacific with a chain of oceanographic institutions like the one at La Jolla, which will serve as headquarters for the laboratory attack on ocean problems and as bases for the operation of scientific expeditions in the field. The Council recognized that the vastness of the Pacific precludes the possibility of any one institution, or any one country, taking over the whole of the work, and agreed upon the great desirability of international effort among all the governments concerned, with a coordinated program of work for all existing institutions as well as the new ones that may be established.

The recklessness with which hunters and collectors, both commercial and scientific, are depleting stocks of wild animals and plants, even in the prolific tropics, was specifically condemned in two resolutions, and conservational measures were suggested. Other resolutions proposed new lines of research, or commended those already in progress. Among these are the study of variations in terrestrial magnetism, of earthquakes in the region of the China Sea, of geological survey work in the same region, of investigations of the structure of certain typical coral islands, and of the mapping of oceanic depths by means of echo-sounding.

Science News-Letter, October 12, 1929

Undulant Fever

Undulant fever, one of the newest diseases of man, is widespread throughout the United States, a survey made by the U. S. Public Health Service has revealed.

For some time this disease, variously known as Malta, Mediterranean or undulant fever, and acquired from the milk of infected cows or goats or from other infected cattle, was thought to be confined to one or two western states. The survey showed that only West Virginia and Wyoming have not had any cases reported during the five year period covered by the investigation. In every other state at least one or two cases were reported during that time. Since the disease is new and unfamiliar, it is likely that many more cases have occurred, unrecognized, than the reports show.

The number of cases reported throughout the country has been steadily climbing from 24 in 1925 to 649 in 1928. For 1929 only 366 cases have been reported thus far. Wisconsin, New York, Ohio, Pennsylvania, South Carolina, California, Illinois, Minnesota and Iowa reported the greatest number of cases in 1929.

The disease is characterized by long continuation with many periods of apparent recovery and subsequent relapses. High fever with rheumatic and neuralgic pains occur, but the disease is not often fatal.

Science News-Letter, October 12, 1929

Do You Know That—

One million people in the United States suffer from hay fever.

It is estimated that 1,000,000 persons in the United States have some form of speech disorder.

No one in France may cultivate tobacco without official authorization.

Massachusetts was the first state to adopt a compulsory school attendance law.

One of the great cork-oak trees of Portugal may yield as much as 500 pounds of cork.

Some desert plants contain water, which travelers find useful in quenching their thirst.

A new device for making names of streets visible at night is a flashing sign placed at the curb.

"Prove All Things"

ERICH WASMANN, in *Modern Biology and the Theory of Evolution* (Herder):

Nature is intolerant of constraint applied in favor of any particular theory; any one who tries to account for all phenomena in the same way is doomed to failure.

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U. S. Has Most Accidents

The United States has more fatal accidents than any other country, Dr. Louis I. Dublin of the Metropolitan Life Insurance Co. declared at the National Safety Congress. While England and Wales in 1927 had 38 accidental deaths for each 100,000 of population, the United States had 78 per 100,000. Scotland had 50, Sweden 35, France 29, and Germany 36, respectively, per 100,000.

Instead of going down, the number of fatal accidents in this country is increasing. In 1928 there were more than during any other year on record. Automobile accidents are most frequent of all the fatal accidents, being responsible for almost a third of the total. In 1928 there were 27,000 deaths from motor vehicle accidents. These were accompanied by 950,000 serious, non-fatal injuries from the same cause. The reports from the cities and states indicate that the cities of this country are not experiencing as rapid an increase in motor fatalities as are the rural districts, Dr. Dublin said.

Science News-Letter, October 12, 1929

Much Cry; Little Wool

Alexander William Stern in *The Monist*, April, 1929:

At no time is science so much talked about and as little understood by the layman as now.

Science News-Letter, October 12, 1929

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Mound-Builder Weavers

The art of weaving was known to the Indians who built their mounds in Indiana centuries ago, as it was to their compeers of the Hopewell area in Ohio and to the greatly different Indian civilizations of the Southwest. On opening a leather pouch containing a number of copper bracelets excavated from the mound he is exploring at Winchester, Ind., F. M. Setzler found three layers of woven cloth. The Indians knew how to make more than one kind of fabric; for part of the material was finely, part coarsely woven.

Very little woven work by mound-builders has come down to us, because in the damp earth of the mounds it had no chance to be preserved from decay. The pieces which have been recovered have without exception been preserved by contact with copper objects, which formed verdegris, checking the action of fungi and bacteria of decay.

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Boulder Monument

An "old settler" of 400,000 years ago will be utilized by the city of Lawrence, Kans., as a monument to old settlers, and was dedicated October 11, when the city celebrated its 75th anniversary.

The "old settler" thus used is a quartzite boulder, weighing some 23 tons, that was brought by the glaciers to the Kansas river from South Dakota, or perhaps from northeastern Nebraska.

Use of the boulder served to call attention to the fact that the Kansas river marks approximately the extreme limit of the second ice cap, which centered in northern Canada, and extended over much of the north central part of what is now the United States.

Dr. R. C. Moore, head of the department of geology at the University of Kansas, explained that whereas geologists once thought that the "erratics" or boulders of material not found in a given region, had been brought from the north frozen in the bottom of icebergs, it is now believed that they were rolled along, or carried in the bottom of the glacial ice streams.

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The Field Museum has received several great "coral trees" weighing three or four tons each, brought from the Bahamas by a recent expedition.

Rockets for Space Voyages

Voyages through space, from the earth to the moon, or to other planets, are forecast by the recent successful demonstration in Frankfort of a rocket-propelled airplane. In May, 1928, Fritz von Opel, German automobile manufacturer, demonstrated his rocket automobile. Now, after further experiments, he has built an airplane, propelled by the same means, and shown that it is capable of flight.

Interesting as the method is, there is little likelihood that it will ever become a serious competitor of combustion engines in terrestrial vehicles, or airplanes for use in the lower portions of the atmosphere. The rocket depends for its propulsion on the kick given by the explosions. It uses its fuel, whether gasoline, hydrogen and oxygen, or explosives, very rapidly, but only a small amount of the fuel's total energy is available to furnish the necessary "kick". In other words, the rocket has a low efficiency. Where the same fuel can be used to apply energy to the ground, as in the automobile, or to the air, as with the airplane, it is better to use the wheel or propeller to obtain traction.

In getting through the space between the planets, containing less air than in the vacuum of an incandescent lamp, however, the situation is very different. There no air, ground or water is available against which to push and the rocket is the only known means of propulsion. The kick of an explosion is just as powerful in a vacuum as in the air, for the push is against the gases formed by the explosion. In fact, in a vacuum, the rocket would tend to travel somewhat faster, because of the lack of atmospheric resistance.

The theoretical investigations upon the practical uses of the rocket were begun by Prof. R. H. Goddard, American physicist at Clark University, Worcester, Mass. Later mathematical studies were made on the same problem by Prof. Max Vallier of Munich, and Albert Mueller. The results of the latter were made available to the Opel company's engineers.

Some years ago Prof. Goddard startled the scientific world by publishing data showing the possibility of a rocket flight to the moon. These researches have been continued by him since then under the auspices of the Smithsonian Institution. His rocket, he figured, could travel at a speed of 6.6 miles a second, nearly 400 miles an hour. This speed would be sufficient to allow it to escape from the earth's gravitational attraction, and to take it to the moon in eleven hours. His idea was that the rocket would not carry a passenger, but would bear a charge of flash powder, to explode upon impact at the moon's surface. This great flash could then be observed on earth.

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Liquid Propels Rockets

Development of a liquid propellant for rockets that will make possible airplanes much faster than those of the present day is announced by Prof. R. H. Goddard, of Clark University. Prof. Goddard was asked to comment on the recent experiments in Germany with a rocket propelled airplane. His statement follows:

The recent rocket plane in Germany raises the question as to just what bearing this result may have on aviation. According to German aeronautical journals, these rocket auto and airplane experiments are being carried out along the lines of the experimental work that I performed at Clark University in 1916 and which was published by the Smithsonian Institution in 1919.

These published results described expansion nozzles of eight degree taper, electrical ignition by wires through these nozzles and the system of using bundles of similar rockets, all of which are now in use abroad.

A plane equipped with powder rockets, however, has an extremely limited cruising radius unless it is used as a rocket glider. If, on the contrary, liquid propellants are used, capable of supplying a large amount of energy compared with an equal weight of powder and the amount of propellant carried is large compared with the weight of the rocket plane itself, some very surprising distances can be covered in a much shorter time than with an ordinary plane. The development work on liquid propellant rockets planned abroad is unnecessary as my work under the Smithsonian Institution has already produced liquid propellant rockets that operate.

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Prehistoric Doughnuts

Three doughnut-like cakes, with the familiar hole in the center, have been found in Oklahoma caves among relics of Basket Maker Indians. The cakes represent food of Indians who inhabited the Southwest in prehistoric times, before the Pueblos came into the Southwest and before the art of making pottery was discovered.

Dr. E. B. Renaud, who has just completed a two months' expedition to New Mexico and Oklahoma for the Colorado Museum of Natural History, made the discoveries in caves east of Kenton. This is the first time that traces of the old Basket Makers have been found so far east as Oklahoma, he stated.

Relics found in the caves include sandals, bone beads, implements of bone, wood, and stone. There are also seeds, bones of animals eaten by the Basket Makers, and small corncobs, bags of shelled corn, and a bag made of prairie dog skin containing corn on the cob. Fragments of the baskets, which served the Basket Maker Indians as cooking vessels, water jars, and all sorts of containers, were also found.

Eighty-five miles west, in lava caves of New Mexico, Dr. Renaud unearthed similar objects and also a skeleton of a woman resembling the Basket Maker type.

Science News-Letter, October 12, 1929

War on "White Ants"

Paris green, time-honored foe of potato beetles and other insects pests, promises victory in the war which California is waging against termites, sometimes called "white ants", destroyers of millions of dollars of wood-built structures annually. The effectiveness of the Paris green dust depends first on the cleanliness of the termites. They are forever licking themselves clean, and thus swallow the deadly powder.

After they have died or are very notably weakened, a second termite habit comes into play. The insects are cannibals through thrift; they eat up their deceased relatives. It does not matter if the dead termite met its end through poison; it gets eaten anyway. Thus the same dose of Paris green may do away with several termites in succession.

Science News-Letter, October 12, 1929

More than 70 per cent. of the inhabitants of the United States have British blood in their veins.

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Plans for Disaster Board

Plans for a State Disaster Board, to have charge of disaster relief whenever necessary, were laid before the public health engineers of the American Public Health Association by E. L. Filby, Chief Engineer of the Florida State Board of Health and Chairman of the Association's committee on disaster relief.

"The need for State Health Departments to be prepared for disaster duties is becoming more apparent every year," said Mr. Filby. "The public health problems that follow in the wake of every storm and flood are often staggering and unless health departments are prepared to cope with the situation serious difficulties may be expected. The midwestern tornado of 1925, the Mississippi flood of 1927 and Florida's hurricanes of 1926 and 1928 have demonstrated in the states affected the need for disaster preparedness by the State Health Departments."

Under the plan drawn up by Mr. Filby's committee, a fund of at least $50,000 should be made available through legislative appropriations and put at the disposal of the governor for emergency disaster relief. The disasters for which it may be used are to be designated by law.

In addition, a State Disaster Board should be ready, the Board consisting of the Governor as chairman, the Adjutant General directing the National Guard or Militia, the State Comptroller, the State Highway Commissioner, the State Health Officer, the Public Service Commissioner or utility representative, the State Commissioner of Welfare, and a representative of the American National Red Cross, appointed by Washington Headquarters.

These officers should prepare themselves in advance by familiarizing themselves with sources of supplies and personnel that may be called on in an emergency. Cooperation between the Board and other agencies should be fostered before disaster strikes. The particular kinds of disaster to which the state is subject should be studied and relief plans made accordingly.

Science News-Letter, October 12, 1929

FIRST GLANCES AT NEW BOOKS

EARLY HISTORY OF ASSYRIA TO 1000 B. C.—Sidney Smith—*Dutton* ($12). Fills out a series of three volumes on the history of Babylonia and Assyria, of which the earlier volumes on Babylonia were prepared by L. W. King. This account of Assyria's rise is distinctly "timely", for such a book could not have been written a few years ago. Recent archaeological discoveries, notably those at Ur and Kish, have made it possible to test the truth of traditions, and to fill in important gaps in old chronicles. In consequence of these late additions to our knowledge of the ancient world, the usual history book landmarks of battles and dynasties stand out in comparatively slight relief, because of our interest in newfound details about the people themselves, their origin, traits, and manners. The author points out that there are still blank pages in Assyrian history and some of the present interpretations await confirmation. But the story is now complete enough to convince the reader that Assyria is as worthy of his interest as ancient Egypt.

Science News-Letter, October 12, 1929

PRIMITIVE ECONOMICS OF THE NEW ZEALAND MAORI—Raymond Firth—*Dutton* ($6.25). A study in comparative economics, written by a young anthropologist of New Zealand. Tribes such as the Maori have their problems of industry, wealth, land ownership, and distribution of goods; but their solution of these problems has usually been judged in the light of principles set down by civilized countries, with little understanding of local conditions such as natural resources, social institutions, and the primitive human factor. The writer of the preface, R. H. Tawney, points out that studies such as this enable us to turn back to our own economic organization and to view it more clearly, after we have considered a world with different standards and presuppositions.

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NEANDERTHAL (MOUSTERIAN) MAN—Oliver C. Farrington and Henry Field—*Field Museum of Natural History* (25c.). A clear and concise summary of what is known about these prehistoric Europeans, illustrated with striking restorations of the Neanderthal men, women, and children.

Science News-Letter, October 12, 1929

AUDACIOUS AUDUBON—E. A. Muschamp—*Brentano's* ($3.50). A biography of that versatile American genius, who, blamed by his contemporaries because he could not make money, retaliated upon the world by making himself famous and making the descendants of his critics more humanely nature-minded than they would ever have been without him.

Science News-Letter, October 12, 1929

OLD AGE—A. S. Warthin—*Hoeber* ($3). One of the most neglected phases of human existence is here examined carefully and critically, with recourse upon all the resources of physiology, biometry, psychology and allied sciences.

Science News-Letter, October 12, 1929

LITERARY ETHICS—H. M. Paull—*Dutton* ($3.75). All who have to do with the making—or reading—of the literary output of this prolific age will be interested in this study of forgery, plagiarism, and other crimes and misdemeanors in literary activities.

Science News-Letter, October 12, 1929

MODERN MATERIALISM AND EMERGENT EVOLUTION — William McDougall—*Van Nostrand* ($2.75). In this volume the noted author supplements the arguments contained in his "Body and Mind". The theme of the book is stated on the jacket, "This book shows that strictly scientific research establishes the fundamental assumptions of all religion and all morals; namely, that mind controls the world of nature and the process of evolution".

Science News-Letter, October 12, 1929

SYSTEMATIC PSYCHOLOGY: PROLEGOMENA—Edward Bradford Titchener—*Macmillan* ($2.50). A psychology for psychologists, in which a professor set about the task of defining a science which has been singularly difficult to bound, and the complementary task of orienting psychology to biology and physics.

Science News-Letter, October 12, 1929

A BOOK OF INDIAN TALES—Charles Erskine Scott Wood—*Vanguard* ($2). Twenty folk stories told around Indian campfires in the Northwest, and re-told by the author in simple, graphic style.

Science News-Letter, October 12, 1929

PAPAGO MUSIC—Frances Densmore—*U. S. Government Printing Office* ($1.25). Another of Miss Densmore's valuable bulletins in which the music of passing tribes is preserved. She has here recorded music of 167 songs of a desert tribe. In addition to the music, a translation of the Indian words is given, and an analysis of the song, and in many cases a description of the legend, ceremony, or other circumstances associated with the music. There is perhaps no modern record of Indian life which gives us such clear flashes of understanding of the Indian mind and temperament as the words of the old tribal songs.

Science News-Letter, October 12, 1929

AMERICAN CIVIC ANNUAL—Edited by Harlean James—*American Civic Association* ($3). As a record and reference book of civic progress this volume appearing for the first time fills a unique need. National parks, better homes, the federal city, regional planning, highways, building projects, parks, and a variety of other matters vital to better living are treated in short articles by experts.

Science News-Letter, October 12, 1929

ITOGI POLUVEKOVIH RABOT (SUMMARY OF FIFTY YEARS' WORK)—I. V. Michurin—*Novaya Derevnya, Moscow.* A quarto volume summing up the results of a half-century's experiments in the breeding of horticultural plants, particularly of pomaceous fruits, by a man who occupies much the same position in Russia that the late Luther Burbank held in the United States. Printed in Russian, with many colored plates.

Science News-Letter, October 12, 1929

C. R. E. A. NEWS LETTER—*Committee on the Relation of Electricity to Agriculture, Chicago.* The index to the first seven numbers of this periodical shows the immense range of recent applications of electricity to the farm. Among the topics treated are electric incubation and brooding, the lighting of homes and barns, pumping water for irrigation, dish washing, cow milking, refrigeration, ventilation, tool grinding, food chopping, insect catching, paint spraying, pig raising, and carpet sweeping.

Science News-Letter, October 12, 1929

What is the word I want

WORDS! Little things, but mighty in importance because they form your contact with other people in business and pleasure pursuits. Daily you are judged by your choice of words to express your thoughts. But when there is just one word to convey your idea clearly, how to find it among the hundreds of thousands in our language? The dictionary gives you meanings, but for choice it is only as good as your memory. The ordinary thesaurus offers you choice, providing you know the *exact* meaning of every word.

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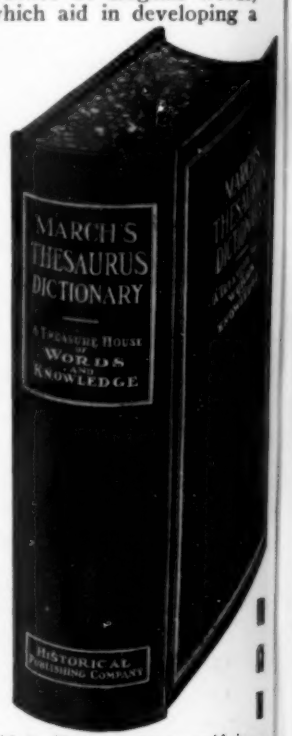

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CLASSICS OF SCIENCE: Franklin Plays With Electricity

A letter describing the famous kite experiment, one of the decisive experiments in the history of electricity, is followed by Franklin's accounts of some shocking parlor tricks with electricity which made him the life of the party. The "phial" or "electric bottle" is, of course, the Leyden Jar.

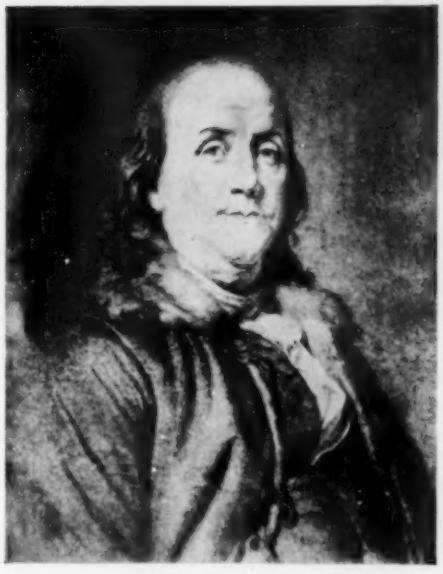
NEW EXPERIMENTS AND OBSERVATIONS ON ELECTRICITY. Made at Philadelphia in America. By Benjamin Franklin, Esq; and Communicated in Several Letters to Peter Collinson, Esq; of London. Part I. The Third Edition. London: 1760.

Letter X. from Benjamin Franklin, Esq; of Philadelphia.

Oct. 19, 1752.

As frequent mention is made in the newspapers from *Europe*, of the success of the *Philadelphia* experimen for drawing the electric fire from clouds by means of pointed rods of iron erected on high buildings, *&c.* it may be agreeable to inform the curious that the same experiment has succeeded in *Philadelphia*, though made in a different and more easy manner, which is as follows:

Make a small cross of two light strips of cedar,* the arms so long as to reach to the four corners of a large thin silk handkerchief when extended; tie the corner of the handkerchief to the extremities of the cross, so you have the body of a kite; which being properly accommodated with a tail, loop, and string, will rise in the air, like those made of paper; but this being of silk, is fitter to bear the wind and wet of a thunder gust without tearing. To the top of the upright stick of the cross is to be fixed a very sharp-pointed wire, rising a foot or more above the wood. To the end of the twine, next the hand, is to be ty'd a silk ribbon, and where the silk and twine join, a key may be fastened. This kite is to be raised when a thunder gust appears to be coming on, and the person who holds the string must stand within a door, or window, or under some cover, so that the silk ribbon may not be wet; and care must be taken that the twine does not touch the frame of the door or window. As soon as any of the thunder clouds come over the kite, the pointed wire will draw the electric fire from them, and the kite, with all the twine, will be electrified, and the loose filaments of the twine will stand out every way, and be attracted by an approaching



BENJAMIN FRANKLIN

finger. And when the rain has wet the kite and twine, so that it can conduct the electric fire freely, you will find it stream out plentifully from the key on the approach of your knuckle. At this key the phial may be charged; and from electric fire thus obtained, spirits may be kindled, and all the other electric experiments be performed, which are usually done by the help of a rubbed glass globe or tube; and thereby the sameness of the electric matter with that of lightening completely demonstrated. B. F.

The Electric Kiss

As the vessel is just upon sailing, I cannot give you so large an account of *American* Electricity as I intended: I shall only mention a few particulars more,—We find granulated lead better to fill the phial with, than water, being easily warmed, and keeping warm and dry in damp air.—We fire spirits with the wire of the phial.—We light candles, just blown out, by drawing a spark among the smoke between the wire and snuffers.—We represent lightning, by passing the wire in the dark over a china plate that has gilt flowers, or applying it to gilt frames of looking-glasses, &c.—We electrise a person twenty or more times running, with a touch of the finger on the wire, thus: He stands on wax. Give him the electrised bottle in his hand. Touch the wire with your finger, and then touch his hand or face; there are sparks every time.—We increase the force of the electrical kiss vastly, thus: Let *A* and *B* stand on wax; give one of them the electrised phial in hand; let the other take hold of the wire; there will be a small spark; but when their lips approach they will be struck and shock'd. The same if another gentleman and lady, *C* and *D*, standing also on wax, and joining hands with *A* and *B*, salute, or shake hands.—We suspend by fine silk thread a counterfeit spider, made of a small piece of burnt cork, with legs of linnen thread, and a grain or two of lead stuck in him to give him more weight. Upon the table, over which he hangs, we stick a wire upright as high as the phial and wire, two or three inches from the spider; then we animate him by setting the electrified phial at the same distance on the other side of him; he will immediately fly to the wire of the phial, bend his legs in touching it, then spring off; and fly to the wire in the table; thence again to the wire of the phial, playing with his legs against both in a very entertaining manner, appearing perfectly alive to persons unacquainted. He will continue this motion an hour or more in dry weather.

"The Conspirators"

The magical picture is made thus. Having a large metzotinto with a frame and glass, suppose of the KING (God preserve him) take out the print, and cut a pannel out of it, near two inches distant from the frame all round. If the cut is through the picture 'tis not the worse. With thin paste, or gum-water, fix the border that is cut off on the inside of the glass, pressing it smooth and close, then fill up the vacancy by gilding the glass well with leaf gold or brass. Gild likewise the inner edge of the back of the frame all round except the top part, and form a communication between that gilding and the gilding behind the glass: then put in the board, and that side is finished. Turn up the glass, and gild the fore side exactly over the back gilding, and when it is dry, cover it by pasting on the pannel of the picture that hath been cut out, observing to bring the correspondent parts of the border and picture together, by which the picture will appear of a piece as at first, only part is be- (*Turn to next page*)

Franklin and Electricity—*Continued*

hind the glass, and part before.—Hold the picture horizontally by the top, and place a little moveable gilt crown on the king's head. If now the picture be moderately electrified, and another person take hold of the frame with one hand, so that his fingers touch its inside gilding, and with the other hand endeavour to take off the crown, he will receive a terrible blow, and fail in the attempt. If the picture were highly charged, the consequence might perhaps be as fatal as that of high-treason; for when the spark is taken through a quire of paper laid on the picture, by means of a wire communication, it makes a fair hole thro' every sheet, that is, thro' 48 leaves, (though a quire of paper is thought good armour against the push of a sword, or even against a pistol bullet) and the crack is exceeding loud. The operator, who holds the picture by the upper end, where the inside of the frame is not gilt, to prevent its falling, feels nothing of the shock, and may touch the face of the picture without danger which he pretends is a test of his loyalty.—If a ring of persons take the shock among them, the experiment is called, *The Conspirators.*

On the principle that hooks of bottles, differently charged, will attract and repel differently, is made an electrical wheel, that turns with considerable strength. A small upright shaft of wood passes at right angles through a thin round board, of about twelve inches diameter, and turns on a sharp point of iron fixed in the lower end, while a strong wire in the upper end passing thro' a small hole in a thin brass plate, keeps the shaft truly vertical. About thirty *radii* of equal length, made of sash-glass cut in narrow strips, issue horizontally from the circumference of the board, the ends most distant from the center being about four inches apart. On the end of every one, a brass thimble is fixed. If now the wire of a bottle electrified in the common way, be brought near the circumference of this wheel, it will attract the nearest thimble, and so put the wheel in motion; that thimble, in passing by, receives a spark, and thereby being electrified is repelled, and so driven forwards; while a second being attracted, approaches the wire, receives a spark, and is driven after the first. . . .

"The Golden Fish"

From the before-mentioned law of electricity, that points, as they are more or less acute, draw on and throw off the electrical fluid with more or less power, and at greater or less distances, and in larger or smaller quantities in the same time, we may see how to account for the situation of the leaf gold suspended between two plates, the upper one continually electrified, the under one in a person's hand standing on the floor. When the upper plate is electrified, the leaf is attracted and raised towards it, and would fly to that plate, were it not for its own points. The corner that happens to be uppermost when the leaf is rising, being a sharp point, from the extream thinness of the gold, draws and receives at a distance a sufficient quantity of the electrical fluid to give itself an electrical atmosphere, by which its progress to the upper plate is stopt, and it begins to be repelled from that place, and would be driven back to the under plate, but that its lowest corner is likewise a point, and throws off or discharges the overplus of the leaf's atmosphere, as fast as the upper corner draws it on. Were these two points perfectly equal in acuteness, the leaf would take place exactly in the middle space, for its weight is a trifle, compared to the power acting on it: But it is generally nearest the unelectrified plate, because, when the leaf is offered to the electrified plate at a distance, the sharpest point is commonly first affected and raised towards it; so that point, from its greater acuteness, receiving the fluid faster than its opposite can discharge it at equal distances, it retires from the electrified plate, and draws nearer to the unelectrified plate, till it comes to a distance where the discharge can be exactly equal to the receipt, the latter being lessened, and the former encreased; and there it remains as long as the globe continues to supply fresh electrical matter. This will appear plain, when the difference of acuteness in the corners is made very great. Cut a piece of *Dutch* gold (which is fittest for these experiments on account of its greater strength) into [this] form: the upper corner a right angle, the two next obtuse angles, and the lowest a very acute one; and bring this on your plate under the electrified plate, in such a manner as that the right-angled part may be first raised (which is done by covering the acute part with the hollow of your hand) and you will see this leaf take place much nearer to the upper than the under plate; because without being nearer, it cannot receive so fast at its right-angled point, as it can discharge at its acute one. Turn this leaf with the acute part uppermost, and then it takes place nearest the unelectrified plate; because, otherwise it receives faster at its acute point than it can discharge at its right-angled one. Thus the difference of distance is always proportioned to the difference of acuteness. Take care in cutting your leaf to leave no little ragged particles on the edges, which sometimes form points where you would not have them. You may make this figure so acute below and blunt above, as to need no under plate, it discharging fast enough into the air. When it is made narrower . . . we call it the *Golden Fish*, from its manner of acting. For if you take it by the tail, and hold it at a foot or greater horizontal distance from the prime conductor, it will, when let go, fly to it with a brisk but wavering motion, like that of an eel through the water; it will then take place under the prime conductor, at perhaps a quarter or half an inch distance, and keep a continual shaking of its tail like a fish, so that it seems animated. Turn its tail towards the prime conductor, and then it flies to your finger, and seems to nibble it. And if you hold a plate under it at six or eight inches distance, and cease turning the globe, when the electrical atmosphere of the conductor grows small, it will descend to the plate and swim back again several times with the same fish-like motion, greatly to the entertainment of spectators. By a little practice in blunting or sharpening the heads or tails of these figures, you may make them take place as desired. nearer, or farther from the electrified plate.

Benjamin Franklin (1706-1790), the great American printer, publisher, author, athlete, linguist, legislator, diplomat, scientist and inventor, was responsible for organizing among other things police and fire departments and the Pennsylvania militia, the University of Pennsylvania, the American Philosophical Society, street paving and lighting, a city hospital and the Post Office Department. His researches on static electricity are classics of their period in the development of that science.